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C O N F I D E N T I A L SECTION 01 OF 05 RIYADH 000525

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TAGS: [EPET](#) [ENRG](#) [SENV](#) [SA](#)

SUBJECT: SAUDI PLANS FOR UPSTREAM AND DOWNSTREAM EXPANSION

REF: RIYADH 313

Classified By: AMBASSADOR JAMES OBERWETTER FOR REASONS
1.4 B, D, AND E

Summary

¶1. (U) This cable reviews Saudi plans for upstream and downstream expansion, discussed during the February US-Saudi Energy Working Group meeting in Riyadh. The Saudi presenters confirmed Saudi Aramco's plans to reach 12 million barrels per day (mbpd) production capacity by 2010-2011, including bringing on-line the 1.2 mbpd Khurais and 900,000 bpd Manifa fields (in addition to production in the Saudi Arabia-Kuwait Partitioned Neutral Zone, the PNZ). They highlighted production gains through technologies such as improved seismic imaging, geo-steering, and powers simulation technology. Meanwhile, Saudi Aramco is also planning significant growth in the downstream sector, expanding and installing more efficient and environmentally-friendly equipment in existing refineries, and also building at least four greenfield refineries. In line with current trends in the refining sector, Saudi Aramco has focused its new capacity on processing heavier sour crude, producing cleaner gasoline and diesel, and making energy conservation gains. The Saudi interlocutors indicated stringent product quality standards, particularly multiple and tighter environmental standards around the world, pose a great challenge to Saudi Aramco. Saudi Arabia's OPEC Governor left open the option of future joint ventures (JVs) in the gas arena, depending on the performance of existing JVs.

Review of Current Reserves and Production

¶2. (U) During the EWG discussions, Saudi Aramco's Dr. Mohammed Al-Qahtani, Manager, Reservoir Description and Simulation Department, conducted a presentation on behalf of the Ministry of Petroleum and Mineral Resources (MOPMR) on "Exploration and Development Activities and Technologies." By way of background, Al-Qahtani noted Saudi Aramco has 96 oil and gas fields, 260 billion barrels of proven oil reserves, and 239 trillion standard cubic feet (scf) of gas.

Al-Qahtani placed current sustainable oil production at 10.8 mbpd, and 9.5 billion standard cubic feet (scf) of gas production. Note: These references do not include production activities in the PNZ). End note.)

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Aramco Plans to Grow Exploration, Development,
and Production by Field to 2011
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13. (SBU) Al-Qahtani fleshed out Saudi Aramco's much-publicized plans to reach 12 mbpd of production capacity within the next five years, pegging production growth to the following targets:

2007	10.8 mbpd
by 2008	to 11.0 mbpd
by 2009	to 11.3 mbpd
by 2010-2011	to 12.0 mbpd

(Again, production targets do not include PNZ production. End note.) Al-Qahtani reiterated Saudi Aramco's intention to increase spare capacity to 2 mbpd, noting the company's commitment to maintaining spare capacity distinguishes it from its competitors. Yasser Mufti, Saudi Aramco, Corporate Advisor on Energy Outlook, noted a third of the drilling rigs employed in OPEC are located in Saudi Arabia.

Al-Qahtani offered a limited break-down by field of recent and planned production growth as follows:

by 2006	300,000 bpd	Haradh-3 field
by 2007-2008	500,000 bpd	Abu Hadriya, Fadhili,

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		and Khursaniya fields
by 2008	100,000 bpd	Nuayyim field
by 2008	250,000 bpd	Shaybah field
By 2009	1.2 mbpd	Khurais field
by 2011	900,000 BPD	Manifa field

Al-Qahtani remarked some of the additional production would replace natural production declines, while some would represent actual production increases.

14. (SBU) Al-Qahtani termed the Northeast of the Kingdom Saudi Aramco's "core exploration area," stating it would continue extensive exploration and acquisition of 3D seismic data there. He highlighted other areas being explored for both oil and non-associated gas (NAG), including north Riyadh, the Rhub-al-Khali, and the Red Sea region. He estimated the resources in these regions at 716 billion barrels in the ground, broken down into those reserves already recovered, proven reserves, and those which are less certain to come to fruition - possible, probable, or contingent.

106 billion barrels (15 percent) recovered during the past 70 years;
260 billion barrels (36 percent) proven reserves;
350 billion barrels (49 percent) classified as possible, probable, or contingent.

Aramco intends to increase the current output and to maximize reserves. By 2025, the company targets moving 250 billion barrels to the "current" category. Currently, 51 percent of the oil is recovered in this category, with 49 percent remaining "possible." By 2025, Aramco hopes to raise the recovered level to 70 percent, or the equivalent of 150 billion barrels.

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Technology Focus to Improve Production and Recovery
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15. (SBU) Al-Qahtani said Aramco was focusing on a range of

technologies to sustain upstream expansion, lower costs, and increase revenue.

-- Seismic technology: This has been the primary technology behind increasing production. The data helps Aramco find the thickest channels in reservoirs to maximize quality of the crude. al-Qahtani claimed Aramco's seismic technology was based on in-house research and development, to provide a lucid picture of the channels in reservoirs and makes "maximum reservoir contact" (MRC) wells more efficient. He stated in 2006 that Aramco doubled the yield at the Karin field with this technology, increasing output from 40 to 80 million scf.

-- Geo-steering: Aramco is using geo-steering (directional drilling) in many well-developed fields. At Abqaiq & 474,8 Al-Qahtani stated that Aramco's use of geo-steering produced a sevenfold improvement in output to 700,000 bpd, compared to nearby wells, despite the field being 60 years old. In the Khurais field, this technique has improved efficiency by 50 percent over the past three years.

-- Powers Simulation technology: Aramco uses these simulations for highly accurate forecasts. The company has perfected a resolution of 17 million cells (or the equivalent of megapixels in a digital camera). In a few years' time, Aramco expects the technique to reach up to 100 million cells within a few years, and to reach 1 billion cells by 2017.

-- I-Field: Aramco is developing the capability for real time data on wells through a system of subsurface sensors and controls in reservoirs. This will allow for real time reservoir management and MRC. By using MRC techniques at Haradh, Aramco increased yields per well from 2000 bpd in 1996, to 4000 bpd in 2003, and finally to 10,000 bpd in 2006. Al-Qahtani stated Aramco has reduced the water cut at the Ghawar field from 50 percent to 32 percent using MRC.

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In the medium to long term, Aramco plans to develop "extreme contact well" technologies and nano technologies at the core levels of reservoirs. With nano technologies, the company hopes to "destroy" heavy oil and actually change the properties of a reservoir.

Refining Margins Up, but Proliferating Product
Specifications Remain a Challenge

16. (U) Salahaddin Dardeer, Superintendent of Engineering of the Riyadh Refinery, conducted the Saudi's downstream presentation. Aramco saw a large increase in its refining profit margins in 2003-2004, and expects a flatter increase in 2005-2006. Higher crude prices and refining margins have attracted new investors and funds. The company believes worldwide refining capacity is inadequate, since utilization stands at 86 percent. The biggest challenge for the downstream side will be the growth in demand from the expected population growth over the next five years, which could translate into an 8 percent increase in demand worldwide.

17. (U) Dardeer laid out Saudi Aramco's goals to build new refining capacity to process heavier sour crude, produce cleaner gasoline and diesel, and make gains in energy conservation. He cautioned refined product supply and demand remain volatile. There is a wide variation in requirements in many markets for cleaner burning fuel. He noted that stringent product quality standards, particularly multiple and tighter environmental standards, pose a great challenge to Saudi Aramco. Meanwhile, the global mix of crude continues to shift to heavier and sourer production, influencing Saudi Aramco's refinery configuration. Department of Energy Assistant Secretary Harbert commented on the proliferation of

boutique fuel requirements in the U.S., noting that DOE finally took executive action to decrease the complexity of state-mandated fuel requirements and increase margins for refining. New policies require companies to slim down to seven different fuels.

Downstream Expansion Plans Focus
on Heavy Crude, Growing Export Capacity

18. (U) Saudi Aramco plans to boost Saudi Arabia's overall refining capacity from 3 mbpd to 6 mbpd, and is currently meeting domestic needs with 1 million bpd of crude devoted to processing fuel oil, gas, and diesel. New environmental laws coming into effect in mid-2007 will require the use of scrubbers in Saudi refineries.

19. (U) Refinery Expansion Plans: Dardeer explained Saudi Aramco's wide-ranging plans to expand and modernize existing refineries. It plans to increase the capacity at Yanbu Refinery from 230,000 bpd to 360,000 bpd, and install a continuous catalytic reformer (CCR) to maximize liquid petroleum gas (LPG) recovery. It will install cogeneration facilities to produce desalinated water and power at both the Ras Tanura and Rabigh refineries. (Note: In May 2005, Saudi Aramco already commissioned cogeneration equipment at Riyadh Refinery. End note.) Diesel hydro treaters (DHT) will be installed at Riyadh, Yanbu, and Ras Tanura refineries to produce low-sulfur diesel to meet local air quality standards. At Riyadh Refinery, a sulfur recovery unit will capture acid gas, with the aim of reducing sulfur emissions. Saudi Aramco has also reviewed plans to expand Rabigh Refinery into a major petrochemical complex with partner Sumitomo Chemical.

110. (U) Greenfield Refineries: Dardeer stated Saudi Aramco would construct two new joint venture export refineries of 400,000 bpd each, with Total (at Jubail) and ConocoPhillips (at Yanbu) to meet demand for processing facilities for heavy crude; final investment decision (FID) is expected by the end of 2007. (Note: Press reports indicate the full conversion refineries are slated for completion in 2011, and designed to

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process Arab Heavy crude (AHC). Aramco plans to build a topping (distillation) refinery, also designed to process 400,000 bpd of AHC. Dr. Majid Al-Moneef, OPEC Governor for Saudi Arabia, stated the topping refinery was designed for domestic use, to meet the huge demand for fuel oil for power generation and desalinated water production, but will also be integrated into the planned Dow petrochemical project at Ras Tanura to provide intermediate products for further processing. Depending on pricing, in the future, he indicated the SAG will encourage utilities to use fuel oil instead of crude. Dardeer also noted the MOPMR had announced a tender for a private refinery to be built at Jizan. (Note: The November 2006 announcement at the Saudi Energy Forum that the SAG would allow the construction of a fully private refinery created significant buzz among Saudi firms, and answered their demand they be allowed to compete in the sector without a parastatal partner. However, there has been little information to date on the terms of the tender. End note.) Finally, the SAG is continuing to construct the "mineral city," Ras Azur, devoted to mineral exploration, particularly bauxite and phosphate inputs for the petroleum industry

International Expansion Plans

111. (SBU) On the international front, Dardeer laid out Saudi Aramco's plans to increase the capacity of the Motiva refinery at Port Arthur, Texas, to 600,000 bpd, and construct a new 480,000 bpd refinery with S-Oil in South Korea. In

partnership with ExxonMobil, Saudi Aramco plans to expand the Fuijin Refinery in China from 80,000 to 240,000 bpd, but they are waiting for final pricing structure details from the Chinese Government. Dardeer noted the refinery upgrade will allow it to process heavier Saudi crude. Dr. Al-Moneef stated Saudi Aramco is now taking medium and light crude into Fuijin for processing, but will also bring in Brazilian Heavy in the future.

Additional Gas Development JVs Possible;
Aramco Content with Pace of Gas Discoveries

¶12. (SBU) Department of Energy Deputy Assistant Secretary Hegburg queried about the likelihood of additional gas joint ventures. Dr. Al-Moneef responded it would depend on the performance of the existing JVs. (Note: Saudi Aramco has existing joint ventures for gas exploration in the Rhub-al Khali with the Chinese National Oil Company (CNOC), Lukoil, and Shell. End note.) Once they get good results, we may offer others, he continued. Remarking on the first entry of foreign firms into the Saudi upstream in more than thirty years, albeit in gas rather than oil, Al-Moneef remarked, "the principle is established." Asked about the prospects of importing gas, MOPMR's al-Muhanna added Saudi Aramco is actively seeking and finding new NAG every year, and did not foresee the need to import gas. Dr. Al-Moneef added Saudi Aramco has added 5 trillion scf of gas reserves every year since 1999. Al-Qahtani indicated associated gas (AG) and non-associated gas (NAG) capacity totaled 9.5 billion scf of raw gas, and the Karan gas field, with 1 billion scf of gas, would be under development by 2012. He stated Saudi Aramco produces about 4 billion scf of AG, and up to 4.8 to 5 billion scf of NAG in the summer, but less in the winter.

MOPMR Discounts Impact of Increased
Refining Capacity Saudi Crude Exports

¶13. (SBU) DAS Hegburg queried about the future availability of crude (versus refined product) for export, given the large refinery capacity coming on-line in Saudi Arabia within the next few years, and the impact on Saudi Arabia's position as the market maker in the international crude oil market. Al-Moneef disagreed with the conclusion that increased downstream capacity would significantly diminish Saudi

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Arabia's role as a market maker, or its ability to meet customer demand for crude. He pointed out Saudi Arabia's crude production capacity was increasing in tandem with its refining capacity. At today's production of about 8.7 mbpd, Saudi Aramco keeps about 3 mbpd for its domestic refineries, and exports another 5 million-plus bpd. By 2012, the company will produce about 10.5 mbpd of its 12 mpd installed capacity, keeping about 6 mbpd for domestic refineries, leaving 4.5 mbpd for export as crude.

Saudi Aramco in Step with Global Refining Trends

¶14. (U) Saudi Arabia is in step with a number of global refining trends in planning new projects for its downstream sector. Periodic tight demand for refined products is encouraging continued investment in new capacity, even as Saudi Aramco has acknowledged it must expand in a more efficient and environmentally friendly manner. Upgrades will improve refinery margins, and the company also plans to retire poorly performing assets. Saudi Aramco intends to move more heavily into the export of refined products, while continuing what is views as its primary obligation, ensuring self-sufficiency in meeting domestic demand. Aramco is moving to accommodate increasingly heavy global crude

feedstocks and the demand for increased refining capacity for heavy fuels. Tighter fuel specifications in the U.S. and Europe, propelled by environmental concerns are driving new refining configurations and equipment purchases, even as Saudi Arabia's own environmental laws are also forcing greater attention to such concerns in the Kingdom.

Comment:

¶15. (C) However, beyond the usual commercial pressures and new trends in refining, Saudi Arabia faces over the coming decades a serious demographic challenge to provide basic services, particularly water and power, to an exploding population. Saudi Arabia is projected to grow from about 25 million to more than 40 million by 2025, even as the average woman continues to bear 5.7 children in her life; 43% of the current population is under the age of 15. The country already relies on desalination for more than 70% of its drinking water, but the life span of most of its desalination plants, constructed in the oil boom of the 1970s, is coming to an end. Cities such as Jeddah have seen unrest due to insufficient water during the last year, and the SAG acknowledges the country is still depleting its limited aquifers at an unsustainable rate. These population pressures are profoundly shaping the future of Saudi Arabia's downstream sector. Incorporating technological advances in areas such as co-generation of power and water has become a necessity for Saudi Arabia to meet surging demand for utility services. The SAG also hopes to drive new employment for its young population by increased investment and diversification beyond upstream oil and gas production into more complex petrochemicals and manufacturing. Fortunately for the SAG, the oil price boom of recent years, prudently invested, should allow it to build the infrastructure to provide for its growing population.

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